

Staff Report

Subject: 2004 Rattle Fire Monitoring
Position: STEP Range Technician – Moab Field Office BLM
Date: September 21, 2004

Monitoring Objectives

The primary goals of this project are to integrate remote sensing, GIS, and ground observations to monitor the success or failure of ESR revegetation treatments and map the vegetative recovery. In order to meet these goals I have: (1) Implemented field monitoring to evaluate treatment effectiveness by comparing plant composition, frequency, and cover at the species level; (2) Initiated the acquisition of remote sensing imagery to monitor and map the vegetative recovery using metrics of plant phenology and community composition/structure; (3) Collected data layers in a GIS for visualization and analysis.

Methodology

The field monitoring for the 2004 growing season included 22 individual 50-meter line-point intercept transects read for cover, frequency, and composition using a laser point bar. Green Fractional Cover (GFC) was also measured along and orthogonal to many of these transects with a Decagon First Growth Fractional Cover camera. These GFC data will be used in the validation of a remotely sensed fractional cover vegetation map. Polygons of homogenous vegetation were also mapped for the purpose of training remotely sensed data for the classification and creation of a dynamic vegetation cover map. Repeat photography was initiated at each transect.

May (Fig. 1) and July (Fig. 2) color-infrared (CIR) images (1 meter resolution) have been collected over the Diamond and Cottonwood treatment areas. The images are being pre-processed and re-mosaicked by the Remote Sensing Services Lab at Utah State University and are scheduled for delivery by Oct. 31, 2004. Vegetation and Fractional Cover maps will be produced using these images once the cool season and warm season mosaics have been adequately corrected for spatial and radiometric errors. Remote sensing products and analysis will be completed before the beginning of the next field season.

This multi-scale approach was selected due to the size and remoteness of the Rattle fire. Field monitoring provides a detailed look at a few small areas and allows us to determine success or failure from a traditional range

values for cheatgrass validating this conclusion. Expanding broadleaf deciduous canopies can also be clearly seen in the two images. Areas of red in the June image that are not broadleaf canopies are predominately annual chenopods with low cover of seeded grasses.

Understanding the reasons for such limited treatment success is difficult due to the inherent complexity of such a project and without research is somewhat speculative. However, landscape-level variability in physical properties such as type, temperature, and moisture of soils in addition to the timing, intensity, and duration of precipitation events may all significantly affect the success of seeding treatments. It is possible that the post-fire increase in overland flow and subsequent flash flooding events are transporting a portion of the treated seed into the channel and out into the Cisco desert. In some areas large floodplains have been created and scoured by flash flooding events which are essentially resetting these areas to the initial stages of primary succession where chenopods appear to dominate. The pre-fire prevalence of a cheatgrass understory and its prolific presence in the seedbank compounded by these other factors makes rehabilitation to native species difficult. Additionally, aerial broadcast seeding typically has less success than drill-seeding or similar methods but due to the extreme topography and WSA status was the only option for distributing seed. Finally, the germination and establishment of treated native seed may not always occur in the three years following the fire but may be on a longer ecological time frame. Success may be dependent on certain precipitation and temperature characteristics that have not yet occurred in these watersheds.

Discussion/Conclusions

Monitoring in FY2005 will follow the same objectives and methodology with a few revisions. The sampling intensity at each transect will be reduced to provide more time to read an additional 6-12 transects. Density quadrats have been discarded from the sampling methodology for the FY2004 and will remain discarded for FY2005. The 0.5 meter interval will produce similar cover data thus reducing the number of points per transect from 100 to 50.

Cover data collection in FY2004 occurred over a 7 week period on the cusp of the cool/warm season. FY2005 cover data collection will be constrained to a 4 week window initiated during the warm season prior to the onset of monsoon precipitation when composition and cover are more static.

I am tentative about making recommendations to use this methodology in other offices until the remote sensing analysis is complete and the aforementioned revisions have been implemented. I think the integration of a ground perspective (transects) and an aerial perspective (remote sensing) will provide a more comprehensive answer to the success or failure question for large, remote, and heterogeneous ESR projects. However, I am still tuning this methodology to make it faster and easier to collect, integrate, and analyze the data. I would be better able to make recommendations at this time next FY after another season of fine tuning and analysis.

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STEP Range Technician

Upper Diamond Canyon

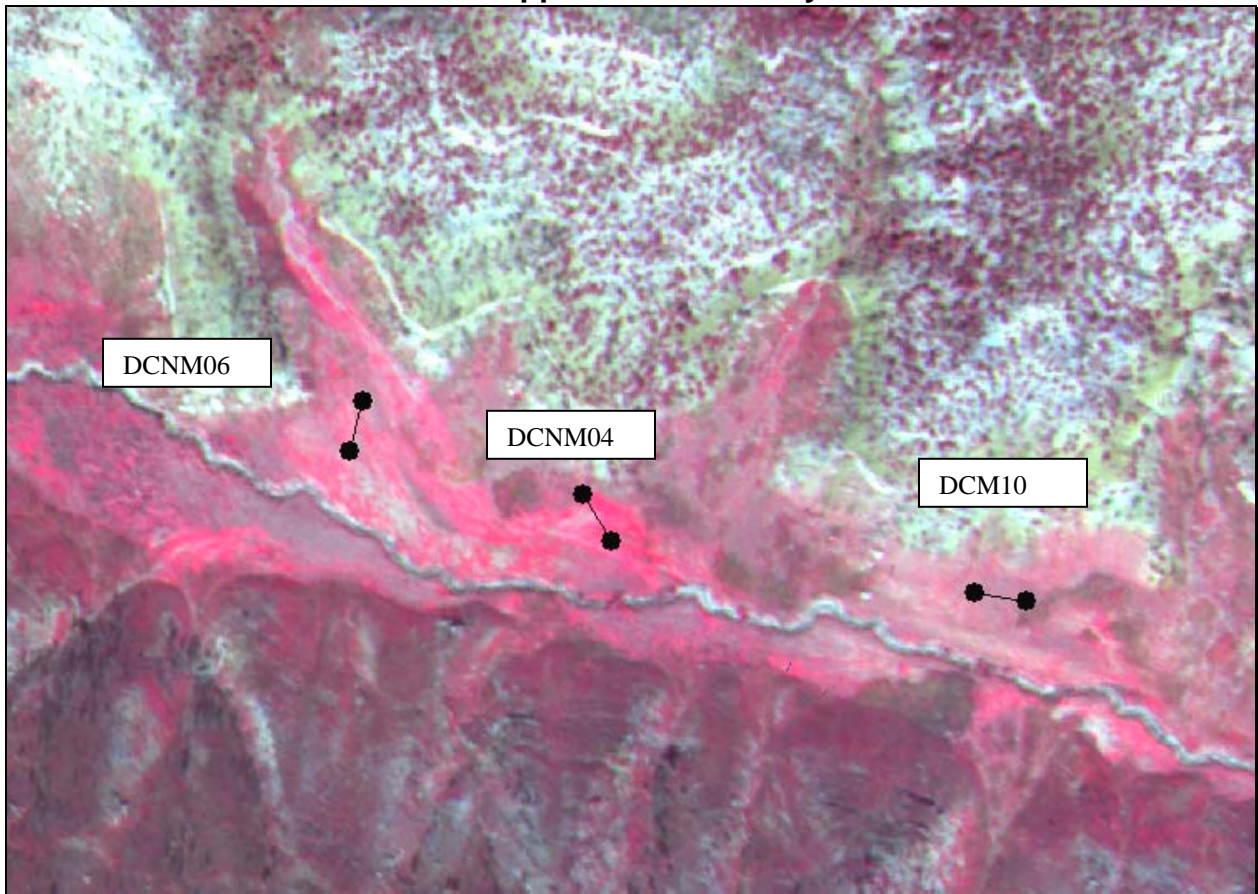


Fig. 1

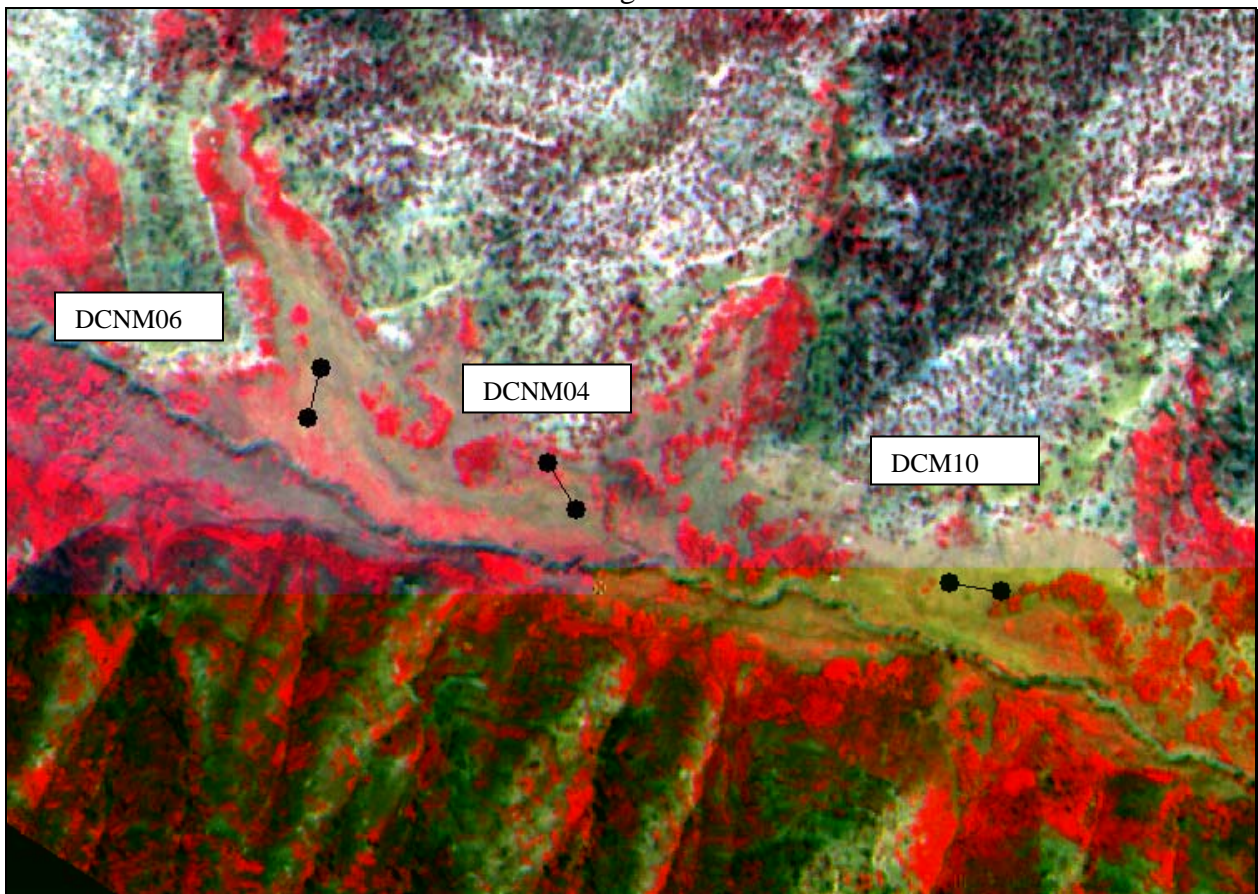


Fig. 2

DCNM06



April 17, 2004 (Fig. 3)



June 4, 2004 (Fig. 4)

DCNM06 Data Summary

6/4/2004

Data collected using laser point bar on angle.

	HITS	Frequency/Cover
<i>All Top Canopy =</i>	67	67%
<i>Bare Soil =</i>	22	22%
<i>Bare Mulch =</i>	0	0%
<i>Bare Litter =</i>	6	6%
<i>Bare Rock =</i>	4	4%
<i>Bare Wood =</i>	1	1%
<i>Total =</i>	100	100%
<i>Top Canopy Veg =</i>	64	64%
<i>AF =</i>	0	0%
<i>AscSub =</i>	0	0%
<i>BroTec =</i>	39	39%
<i>Castijella =</i>	0	0%
<i>CheFre =</i>	0	0%
<i>ChePra =</i>	6	6%
<i>CheSim =</i>	0	0%
<i>Cheno Unknown =</i>	0	0%
<i>CleCol =</i>	0	0%
<i>ChrNau =</i>	0	0%
<i>ChrVis =</i>	0	0%
<i>DesPin =</i>	2	2%
<i>ElyLan =</i>	1	1%
<i>EriDiv =</i>	0	0%
<i>Grass1 (Bluebunch/Thickspike</i>		
<i>Hybrid)</i>	0	0%
<i>LapOcc =</i>	9	9%
<i>LeyCin =</i>	0	0%
<i>LitRud =</i>	0	0%
<i>MelOff =</i>	0	0%
<i>OenCae =</i>	0	0%
<i>PenWat=</i>	0	0%
<i>PG =</i>	0	0%
<i>PhlLon =</i>	0	0%
<i>PoaPra =</i>	0	0%
<i>RumVen =</i>	4	4%
<i>SamCae =</i>	0	0%
<i>SchLin =</i>	3	3%
<i>SphPar =</i>	0	0%
<i>SymOre =</i>	0	0%
<i>Total =</i>	64	64%

	Reference	Orthogonal
<i>Average Green Fractional Cover</i>	NONE	NONE

Note: 0.0 meter hits discarded in all calculations.

Note: L in the soil surface category is interpreted as having bare soil underneath. No true EL is present in Rattle transects yet as it is distinctly separate from the soil itself rather than incorporated.

Note: When L is present in the canopy layers the L is "standing" or "perched" litter. Dead plants from the previous year are considered standing litter. Dead plants from current year are entered by species and are not considered litter.

Fig. 5

DCNM04



April 17, 2004 (Fig. 6)



June 4, 2004 (Fig. 7)

DCNM04 Data Summary

6/4/2004

Data collected using laser point bar on angle.

	HITS	Frequency/Cover
<i>All Top Canopy =</i>	89	89%
<i>Bare Soil =</i>	7	7%
<i>Bare Mulch =</i>	0	0%
<i>Bare Litter =</i>	1	1%
<i>Bare Rock =</i>	2	2%
<i>Bare Wood =</i>	1	1%
<i>Total =</i>	100	100%
<i>Top Canopy Veg =</i>	87	87%
<i>AF =</i>	0	0%
<i>AscSub =</i>	0	0%
<i>BroTec =</i>	57	57%
<i>Castijella =</i>	0	0%
<i>CheFre =</i>	0	0%
<i>ChePra =</i>	10	10%
<i>CheSim =</i>	0	0%
<i>Cheno Unknown =</i>	0	0%
<i>CleCol =</i>	0	0%
<i>ChrNau =</i>	0	0%
<i>ChrVis =</i>	0	0%
<i>DesPin =</i>	2	2%
<i>ElyLan =</i>	0	0%
<i>EriDiv =</i>	0	0%
<i>Grass1 (Bluebunch/Thickspike Hybrid)</i>	0	0%
<i>LapOcc =</i>	6	6%
<i>LeyCin =</i>	2	2%
<i>LitRud =</i>	0	0%
<i>MelOff =</i>	0	0%
<i>OenCae =</i>	0	0%
<i>PenWat=</i>	0	0%
<i>PG =</i>	3	3%
<i>PhlLon =</i>	0	0%
<i>PoaPra =</i>	0	0%
<i>SamCae =</i>	7	7%
<i>SphPar =</i>	0	0%
<i>SymOre =</i>	0	0%
<i>Total =</i>	87	87%

Reference Orthogonal

Average Green Fractional Cover

Note: 0.0 meter hits discarded in all calculations.

Note: L in the soil surface category is interpreted as having bare soil underneath. No true EL is present in Rattle transects yet as it is distinctly separate from the soil itself rather than incorporated.

Note: When L is present in the canopy layers the L is "standing" or "perched" litter. Dead plants from the previous year are considered standing litter. Dead plants from current year are entered by species and are not considered litter.

Fig. 8

DCM10



April 18, 2004 (Fig. 9)



June 11, 2004 (Fig. 10)

DCM10 Data Summary

6/11/2004

Data collected using laser point bar on angle.

	HITS	Frequency/Cover
<i>All Top Canopy =</i>	76	76%
<i>Bare Soil =</i>	3	3%
<i>Bare Mulch =</i>	4	4%
<i>Bare Litter =</i>	5	5%
<i>Bare Rock =</i>	12	12%
<i>Bare Wood =</i>	0	0%
<i>Total =</i>	100	100%
<i>Top Canopy Veg =</i>	59	59%
<i>AF =</i>	2	2%
<i>AscSub =</i>	0	0%
<i>ArtLud =</i>	1	1%
<i>BroTec =</i>	44	44%
<i>Castijella =</i>	0	0%
<i>CheFre =</i>	0	0%
<i>ChePra =</i>	0	0%
<i>CheSim =</i>	0	0%
<i>Cheno Unknown =</i>	0	0%
<i>CleCol =</i>	0	0%
<i>ChrNau =</i>	0	0%
<i>ChrVis =</i>	2	2%
<i>DesPin =</i>	0	0%
<i>ElyLan =</i>	0	0%
<i>EriDiv =</i>	0	0%
<i>Grass1 (Bluebunch/Thickspike</i>		
<i>Hybrid)</i>	0	0%
<i>LapOcc =</i>	3	3%
<i>LeyCin =</i>	0	0%
<i>LitRud =</i>	0	0%
<i>MelOff =</i>	0	0%
<i>OenCae =</i>	0	0%
<i>PenWat=</i>	0	0%
<i>PhlLon =</i>	0	0%
<i>PoaPra =</i>	0	0%
<i>QueGam =</i>	4	4%
<i>SphPar =</i>	0	0%
<i>StiCom =</i>	1	1%
<i>SymOre =</i>	0	0%
<i>VerTha</i>	2	2%
<i>Total =</i>	59	59%

Reference

Orthogonal

Average Green Fractional Cover

Note: 0.0 meter hits discarded in all calculations.

Note: L in the soil surface category is interpreted as having bare soil underneath. No true EL is present in Rattle transects yet as it is distinctly separate from the soil itself rather than incorporated.

Note: When L is present in the canopy layers the L is "standing" or "perched" litter. Dead plants from the previous year are considered standing litter. Dead plants from current year are entered by species and are not considered litter.

Fig. 11